

WHAT IS CLAIMED:

1. A method of promoting plant deep root development, said method
5 comprising:

applying *Trichoderma* spp. to a plant or plant seed under conditions effective to achieve deeper roots in the soil in a treated plant or plant grown from a treated seed than in untreated plants or plants grown from seed not treated with *Trichoderma* spp.

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2. The method according to claim 1, wherein the *Trichoderma* spp. is *Trichoderma harzianum*.

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3. The method according to claim 2, wherein *T. harzianum* is the protoplast fusion progeny T-22.

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4. A method of reducing usage of nitrogen fertilizer in treating a plant, said method comprising:

applying a plant deep root developing agent to a plant or plant seed under conditions effective to reduce nitrogen fertilizer treatment of the plant while achieving a level of plant growth like that achieved when treating the plant with the nitrogen fertilizer but not the deep root developing agent.

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5. A method according to claim 4, wherein the deep root developing agent is a plant enhancing microorganism or humate.

6. A method according to claim 5, wherein the deep root developing agent is a species of *Trichoderma*, *Pseudomonas*, *Streptomyces*, *Bacillus*, *Burkholderia*, or *Fusarium*, humic acid, or mixtures thereof.

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7. The method according to claim 6, wherein the deep root developing agent is a species of *Trichoderma*.

8. The method according to claim 7, wherein the *Trichoderma* species is the protoplast fusion progeny *T. harzianum* T-22.

5 9. A method of imparting drought resistance to plants, said method comprising:

applying a plant deep root developing agent to a plant or plant seed under conditions effective to impart drought resistance to the plant or a plant grown from the plant seed.

10 10. A method according to claim 9, wherein the deep root developing agent is a plant enhancing microorganism or humate.

15 11. A method according to claim 10, wherein the deep root developing agent is a species of *Trichoderma*, *Pseudomonas*, *Streptomyces*, *Bacillus*, *Burkholderia*, or *Fusarium*, humic acid, or mixtures thereof.

12. The method according to claim 11, wherein the deep root developing agent is a species of *Trichoderma*.

20 13. The method according to claim 12, wherein *Trichoderma* is the protoplast fusion progeny *T. harzianum* T-22.

25 14. A method of increasing tolerance of plants to adverse soil conditions, said method comprising:

applying a plant deep root developing agent to a plant or plant seed under conditions effective to impart resistance to adverse soil conditions of the plant while achieving an improved level of plant growth.

30 15. A method according to claim 14, wherein the deep root developing agent is a plant enhancing microorganism or humate.

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16. A method according to claim 15, wherein the deep root developing agent is a species of *Trichoderma* or humic acid, or mixtures thereof.

17. The method according to claim 16, wherein the deep root
5 developing agent is a species of *Trichoderma*.

18. The method according to claim 17, wherein the *Trichoderma* species is the protoplast fusion progeny *T. harzianum* T-22.

10 19. A method according to claim 14, wherein the adverse soil condition is soil compaction.

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